

REMARKS

In the outstanding Office Action, Claims 1-3, 6-8, 10, 15-20, and 25-30 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Number 6,128,535 to Maarse, or in the alternative under 35 U.S.C. §103(a) as obvious over Maarse in view of U.S. Patent Number 6,456,878 to Yerich et al. Claims 2, 9, and 22 were rejected under 35 U.S.C. §103(a) as being obvious over Maarse in view of Yerich et al. Claims 4 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Maarse in view of U.S. Patent Number 6,208,895 to Sullivan et al., or in view of Yerich et al. and Sullivan et al. Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Maarse in view of Yerich et al. and U.S. Patent Number 6,169,921 to KenKnight et al. Claims 12-14, 21, 23, and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Maarse in view of KenKnight et al., or in view of KenKnight et al. and Yerich et al.

Reconsideration is respectfully requested. Claims 1, 18, and 27 are directed to a method and corresponding system that provides biventricular stimulation. According to the method, biventricular stimulation is achieved by delivering a single stimulation pulse in a cross-chamber configuration between an electrode in the left ventricle and an electrode in the right ventricle, which results in the synchronous capture of both ventricles. In other words, using a bipolar configuration that includes an electrode in the right ventricle and an electrode in the left ventricle, the claimed invention achieves simultaneous, biventricular stimulation with only a single stimulation pulse.

The Maarse patent fails to teach or suggest such a method or system. Maarse does disclose a system that includes a right ventricular electrode and a left ventricular electrode, and teaches that the heart's ventricles can be stimulated simultaneously. However, nowhere does Maarse teach or in any way suggest achieving the simultaneous stimulation by delivering a single stimulation pulse between the electrode in the right ventricle and the electrode in the left ventricle. Rather, Maarse simply states that "[t]he electrodes of the present invention may be utilized in conjunction with stimulating the heart's ventricles either simultaneously or sequentially." (col. 5, lines 23-

25), without giving any details as to how the simultaneous stimulation would be achieved.

According to the Examiner, at Column 7, lines 43-62, Maarse discloses an embodiment in which the right ventricle receives a positive pulse, while the left ventricle receives a negative pulse. However, what is actually being disclosed by Maarse at Column 7, lines 43-62, is an embodiment in which only the right ventricular electrode is used to stimulate the heart, and the left ventricular electrode is used to sense the resulting depolarization waveform as it emanates from the right ventricle (which clearly is different from the stimulation pulse). As is shown in FIG. 6, the depolarization waveform 98, caused by the stimulation pulse delivered to the right ventricle, travels outwardly from the site of stimulation, namely the RV electrode 90. The waveform 98 will then pass by the LV electrode 92 as it propagates through the left ventricle. The LV electrode 92 senses the depolarization waveform to confirm that capture occurred in the right ventricle.

Therefore, rather than providing a single stimulation pulse between the LV electrode and the RV electrode, Maarse discloses stimulating the right ventricle using the RV electrode, and then sensing the depolarization waveform as it passes by the LV electrode to verify that capture occurred. Moreover, this embodiment does not achieve simultaneous capture, as the depolarization waveform must propagate from the right ventricle to the left ventricle before the left ventricle will begin to contract. Because of this, Maarse's embodiment will result in contraction of the right ventricle, followed by delayed contraction of the left ventricle, where the delay is based on the time it takes the depolarization waveform to propagate from the right ventricle to the left ventricle.

As described in response to the previous Office Action, Yerich et al. do not teach performing biventricular stimulation using a single pulse delivered in a cross-chamber manner. Yerich et al. teach delivering the cross-chamber stimulation pulse in step S202 "to **only** pace LV or RV" (see S202 of FIG. 5). As is clearly shown in FIG. 5, if biventricular stimulation is to be performed, then steps S204, S206, S208, and S210 are carried out rather than step S202. In step S204, a first stimulation pulse is delivered to either the right ventricle or the left ventricle, and after a V-V delay passes, a second stimulation pulse is delivered to the other ventricle at step S210. Thus, Yerich et al. fail

to teach or in any way suggest performing biventricular stimulation by means of a single, cross-chamber stimulation pulse.

REJECTIONS UNDER 35 U.S.C. §103

Claims 1-3, 6-8, 10, 15-20, and 25-30 were rejected under 35 U.S.C. §103(a) as obvious over Maarse in view of U.S. Patent Number 6,456,878 to Yerich et al. Claims 2, 9, and 22 were rejected under 35 U.S.C. §103(a) as being obvious over Maarse in view of Yerich et al. Claims 4 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Maarse in view of U.S. Patent Number 6,208,895 to Sullivan et al., or in view of Yerich et al. and Sullivan et al. Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Maarse in view of Yerich et al. and U.S. Patent Number 6,169,921 to KenKnight et al. Claims 12-14, 21, 23, and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Maarse in view of KenKnight et al., or in view of KenKnight et al. and Yerich et al.

As described above, Maarse and Yerich et al. fail to teach or suggest a method of biventricular stimulation that delivers a single stimulation pulse in a cross-chamber configuration between the right and left ventricles to synchronously capture both ventricles. Likewise, Sullivan et al. and KenKnight et al. fail to teach or suggest delivering a single stimulation pulse between an electrode in the right ventricle and an electrode in the left ventricle. Therefore, the prior art, whether taken alone or in combination, fails to teach applicant's claimed invention.

CONCLUSION

In light of the above remarks, it is respectfully submitted that the application is in condition for allowance, and an early notice of allowance is requested.

Respectfully submitted,

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Date



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